

**TAB**

ATTACHMENT A

1. The Pneumatic Tube System is an automatic, rapid message dispatch service covering all component offices in every area of the Headquarters Building. It consists of five separate systems (A,B,C,D,E), three of which are complex, interconnected, multi-station units. The other two systems are conventional, point-to-point, 24 hour units. The A, B, and C systems have 115 active stations, which permit material to be sent in a 4 inch round, 14 inch long carrier, from any one station to another through one or more of four monitors. The D and E systems have 8 active stations, but transmission is limited to a specific destination. In the A system (which accounts for the major portion of tube activity) two monitors are required to electrically read, count, and divert carriers to their selected terminus. Because of the magnitude of the area served by B system, a common exhaustor with A system is employed. Therefore, A and B systems are always run simultaneously. An average transmission requires one minute and the longest run is concluded in three and one half minutes. The pneumatic tube systems include 35 miles of tubing and handle one and one third million carriers annually. The first 12 years of operation have provided an efficient and reliable service satisfying a specific need for the Agency.

2. The monitoring stations (4) are the "computers" of the pneumatic tube system which automatically dispatch incoming carriers via various trunk lines to their manually dialed receiving stations. Carriers incorrectly dialed, inserted into the system backwards, or out of adjustment pass through the monitors and are transmitted directly to the reject station. The monitors automatically count both incoming and outgoing line transmissions and send correctly dialed carriers to their designated trunk lines. Included in the monitor stations are a series of "flow" switches which indicate:

a. A temporary loss of vacuum caused by-

(1.) the passage of a carrier in the transmission line

(2.) an open send door

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(3.) a valve open because of an overloaded receiving station

b. An actual blocked line caused by-

(1.) an object jammed in the transmission line

(2.) a broken send door

(3.) a malfunctioning valve

These flow switches are designed to give an indication of any physical trouble source site within 75 feet of the actual disorder. A device to lock all send doors is an in-house addition to the monitoring stations. The send door locks clear the system at the normal close of business time and prevent additional carriers from being dispatched during trouble periods.

3. To better serve customers, three skilled Carrier Maintenance mechanics have been assigned to man the monitors during normal hours of service. Because these men have the necessary expertise and a general familiarity with monitor operation, they are readily able to detect and respond to system abnormalities. Based on current averages, we experience less than one blocked line per day per monitor. Interruptions to service because of blocked transmission lines averages slightly less than one hour per block. The volume of traffic thru the monitor stations daily is approximately as follows:

A system - 94 total stations, 68 active - 5800 carriers (crossover factor between AA and AB monitors 2,200 carriers - 38%)

B system - 35 total stations, 29 active - 900 carriers

C system - 28 total stations, 18 active - 300 carriers (unmanned)

D system - 6 total stations, 6 active - 350 carriers (24-hour, unmanned)

E system - 2 total stations, 2 active - no relative information

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Deducting the crossover factor and excluding E system, the pneumatic tube system handles approximately 1,300,000 carriers each year. This figure includes empty return carriers. Periods of daily peak traffic occur at the following hours:

0830 - 0900  
1000 - 1100  
1400 - 1430  
1600 - 1630

4. As noted, we have 123 active send-receive stations within the five systems. During the 12 years of pneumatic tube system operation, 20 stations have been physically removed from the system and 30 new stations have been installed by our mechanics. Additionally, four stations underwent major modifications. Thus, a station relocation has been completed approximately every 6 months. Practically all of this work was accomplished during non-service hours. At the present there are twenty specific locations which can accomodate future send-receive stations and 42 deactive stations within the automatic A, B, and C systems.

5. The average monitor station is a noisy, unfinished, mechanical room approximating 125 square feet of space and accomodates both equipment and living quarters 8 hours per day for a mechanic who maintains a constant vigil without relief. This situation invites anomie to grow within the individuals manning the monitors and over the years this buildup of ennui has presented some personnel problems. One partially successful effort to make the monitoring task more interesting was to add carrier repair to the monitoring duty. This provided a valuable service for the section. In retrospect, however, this repair may have been better accomplished at the shop site where the majority of the parts are stored and machines are available to accomplish unique requirements. Currently, 75 percent of all shop work is for non-tube related functions, i.e., gym repairs, nameplate manufacture, lock repairs, machine work, etc. //

6. Monitor station "AA" (5C-50) services 67 percent of the total blocked lines in all five systems, averaging one and three quarters blocked lines per day. Over 80 percent of the line blockages result from carriers with

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open "flaps". This is generally attributed to poor user treatment of the system. If this human failing can be reduced substantially, the problem of blocked lines would be insignificant. Additionally, the method of enclosing the carriers (expansion flap with brass clip) has been an uncomfortable compromise in the opinion of the Office of Security. Consequently, since 38 percent of all "A" system carrier flow is between Monitor stations "AA" and "AB", continued surveillance is essential at these two locations. (1)

7. The two persistent problems with the pneumatic tube system at Headquarters are the unreliable closure of the carriers and the improper handling by the users. To reduce the probability of trouble in these areas to a minimal factor, the following recommendations are offered:

a. Modify the carriers to include the velcro closure found satisfactory by NIH. Additionally, test other containment methods such as a screw-on end cap.

b. Schedule periodic instructional classes for all available users of the pneumatic tube systems. Although it is recognized that this measure will not eliminate the human failing; nevertheless, it will reduce careless operating habits.

c. I also strongly recommended that the present method of manning the monitors be modified. Set forth below is an example of an alternative manning schedule. Monitors "AA" and "AB" should be manned during all hours of operation on a rotational four shift assignment to provide overall coverage, better reaction to peak periods and relieve boredom for personnel:

1st. shift 0800 - 0930  
2nd. shift 0930 - 1200  
3rd. shift 1200 - 1500  
4th. shift 1500 - 1700  
Total personnel required - 4 rotating

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The monitors for B and C systems handle approximately 15 percent of the total daily traffic through the pneumatic tube systems. Adequate coverage for these locations would be accomplished with bi-hourly checks by the "floating" mechanic or the lead man. This would furnish sufficient coverage for B system, and give us a bonus by checking the presently unsupervised C system.

8. A further recommendation is to recruit a journeyman machinist to utilize the well equipped Carrier Maintenance Shop and provide greater flexibility for the entire Logistics Services Division. Although this position would fall under the direction of the C/CMS, the incumbent need not be "pneumatic tube system" trained. As noted above, most of the machine shop work is not Carrier Maintenance related. The personnel required to maintain the pneumatic tube system, to react to unique Logistics Services Division requirements, and to accomplish items of executive interest totals seven, i.e.

C/CMS  
Lead Mechanic A/C  
Machinist  
4 Mechanics